HUASHUO SEMICONDUCTOR

HSBG2302

N-Ch 20V Fast Switching MOSFETs

General Description

The HSBG2302 is the high cell density trenched N-ch MOSFETs, which provides excellent RDSON and efficiency for most of the small power switching and load switch applications.

The HSBG2302 meets the RoHS and Green Product requirement with full function reliability approved.

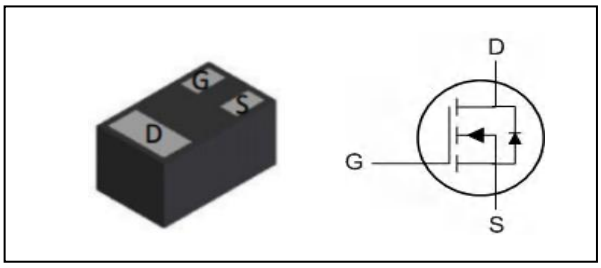
Product Summary

V_{DS}	20	V
$R_{DS(ON),typ}$	62	mΩ
I_D	2	A

Features

- Small Single Switch
- Load Switch
- Low Gate Threshold Voltage

DFN1006 Pin Configuration



Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	20	V
V_{GS}	Gate-Source Voltage	±12	V
I_D@T_A=25℃	Continuous Drain Current, V_{GS} @ 4.5V	2	A
I_{DM}	Pulsed Drain Current	6	A
P_D@T_A=25℃	Total Power Dissipation	0.3	W
T_{STG}	Storage Temperature Range	-55 to 150	℃
T_J	Operating Junction Temperature Range	-55 to 150	℃

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-ambient	---	420	℃/W

Electrical Characteristics (T_J=25 ℃, unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V , I_D=1mA	20	---	---	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance	V_{GS}=4.5V , I_D=1.0A	---	62	75	mΩ
		V_{GS}=2.5V , I_D=1.0A	---	70	85	
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D =250uA	0.4	0.6	0.85	V
I_{DSS}	Drain-Source Leakage Current	V_{DS}=20V , V_{GS}=0V , T_J=25℃	---	---	1	uA
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±12V , V_{DS}=0V	---	---	±100	nA
Q_g	Total Gate Charge	V_{DS}=10V , V_{GS}=4.5V , I_D=0.01A	---	2.3	---	nC
Q_{gs}	Gate-Source Charge		---	0.2	---	
Q_{gd}	Gate-Drain Charge		---	0.4	---	
$T_{d(on)}$	Turn-On Delay Time	V_{DD}=6V , V_{GS}=4.5V , R_G=50Ω R_L=12Ω, I_D=500mA	---	6.6	---	ns
T_r	Rise Time		---	70	---	
$T_{d(off)}$	Turn-Off Delay Time		---	13.5	---	
T_f	Fall Time		---	40	---	
C_{iss}	Input Capacitance	V_{DS}=10V , V_{GS}=0V , f=1MHz	---	196	---	pF
C_{oss}	Output Capacitance		---	24	---	
C_{rss}	Reverse Transfer Capacitance		---	21	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
V_{SD}	Diode Forward Voltage[2]	V_{GS}=0V , I_S=100mA , T_J=25℃	---	0.7	1.0	V

Typical Characteristics

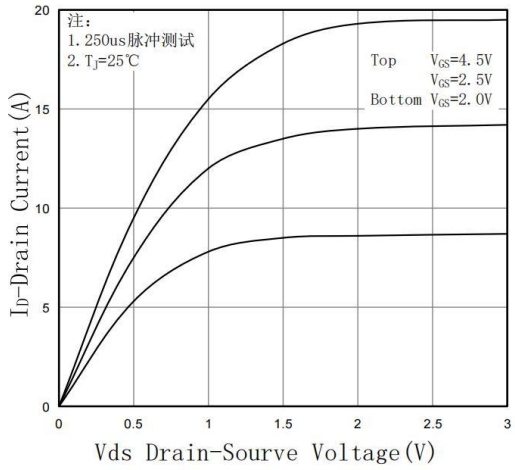


Fig.1 Typical Output Characteristics

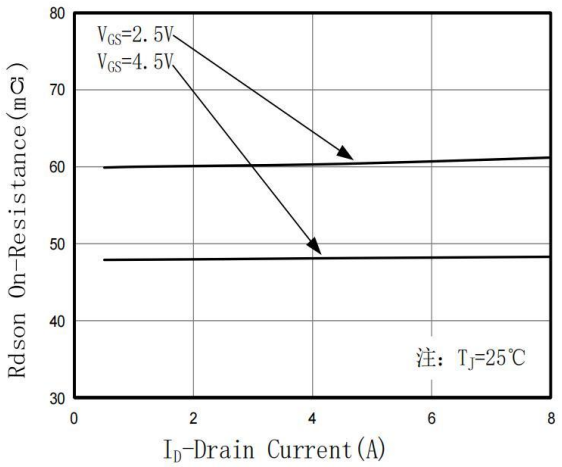


Fig.2 On-Resistance vs. Drain Current

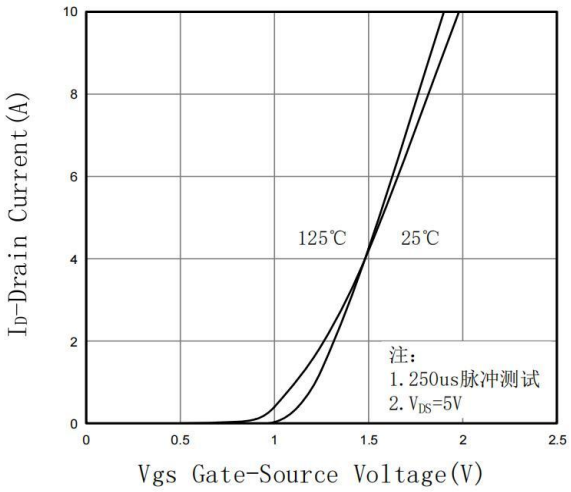


Fig.3 Transfer Characteristics

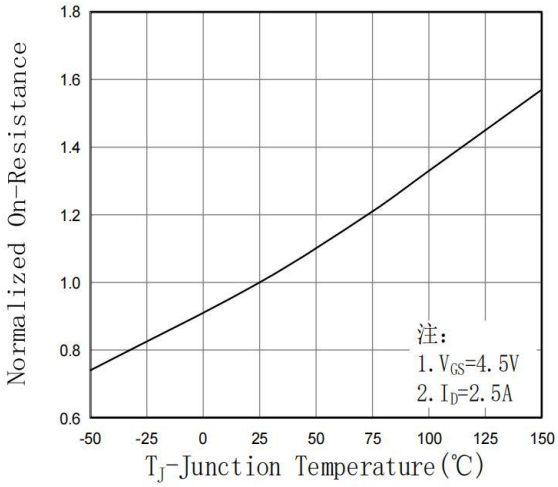


Fig.4 On-Resistance vs. Junction temperature

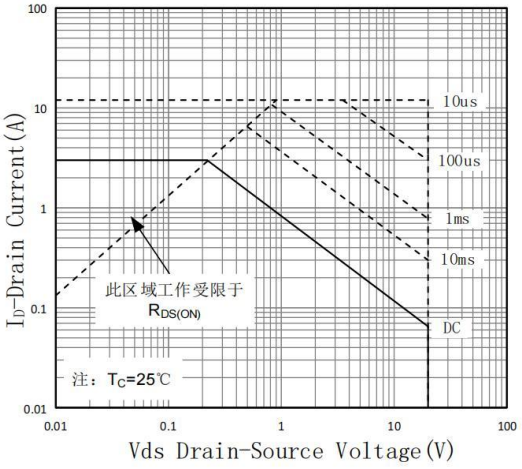


Fig.5 Safe Operating Area

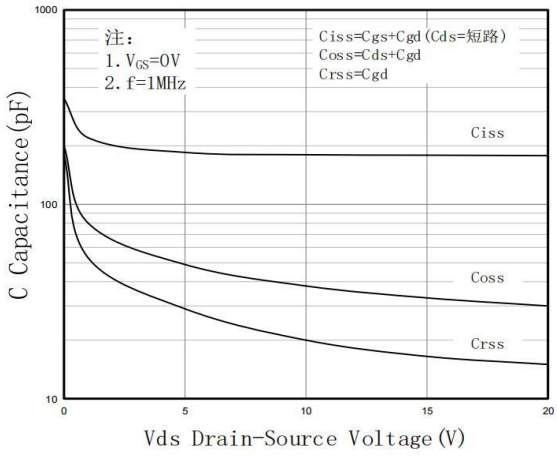


Fig.6 Capacitance Characteristics

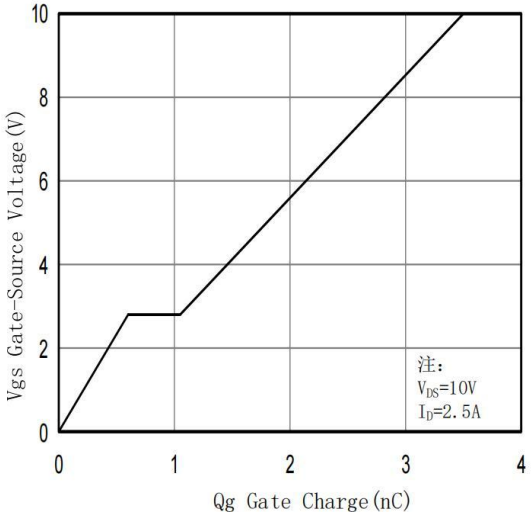


Fig.7 Gate Charge Characteristics

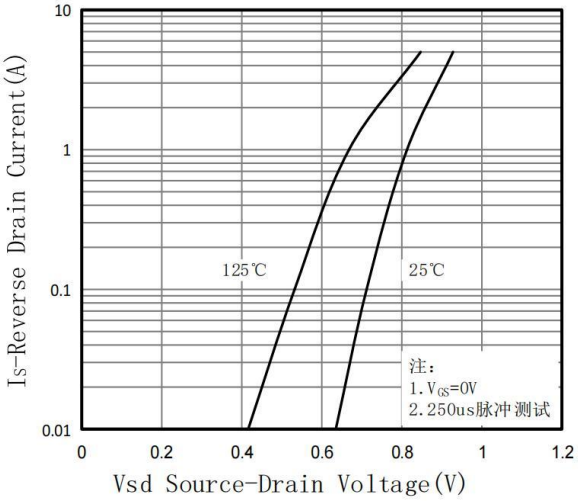
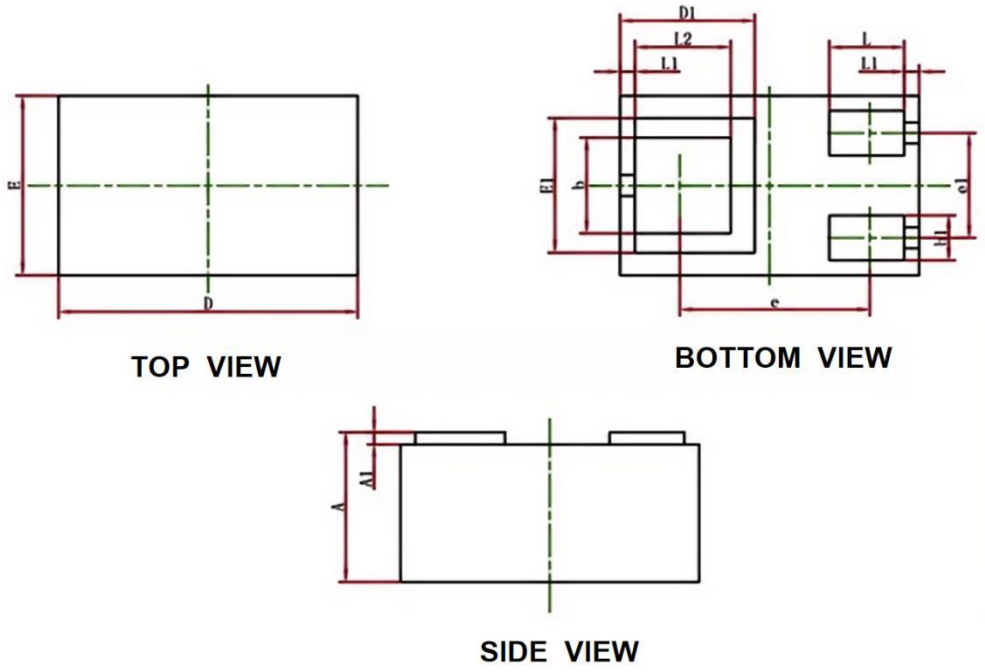


Fig.8 Body Diode Characteristics

Ordering Information

Part Number	Package code	Packaging
HSBG2302	DFN1006-3	10000/Tape&Reel

DFN1006-3 Package Outline



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.450	0.550	0.018	0.022
AL	0.010	0.100	0.000	0.004
D	0.950	1.050	0.037	0.041
E	0.550	0.650	0.022	0.026
D1	0.450REF.		0.0178REF.	
E1	0.450REF.		0.0178REF.	
b	0.270	0.370	0.011	0.015
bl	0.100	0.200	0.004	0.008
e	0.635REF.		0.025REF.	
el	0.300	0.400	0.012	0.016
L	0.200	0.300	0.008	0.012
L1	0.050REF.		0.002REF.	
L2	0.270	0.370	0.011	0.015

HSBG2302 Marking